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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/092,300	03/07/2002	Ho-Jin Kweon	1567.1027	2618

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EXAMINER	
ALEJANDRO, RAYMOND	
ART UNIT	**PAPER NUMBER**
1745	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/092,300	KWEON ET AL.	
	Examiner	Art Unit	
	Raymond Alejandro	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/14/04 (RCE papers)*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,10-24 and 32-39* is/are pending in the application.

4a) Of the above claim(s) *15-23,32,34 and 35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,10-14,24,33 and 36-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/14/04 has been entered.

This communication is responsive to the foregoing RCE and its related responses. The applicants have overcome most of the objections, the 35 USC 102 rejection and the 35 USC 103 rejections. Refer to the abovementioned submission for specific details on applicant's rebuttal arguments and how the prior art of record has been overcome. However, the present claims are newly rejected over art as set forth hereinafter and for the reasons of record:

Election/Restrictions

2. This application contains claims 15-23, 32 and 34-35 drawn to an invention nonelected with traverse in the reply filed on 12/05/03. A complete reply to the rejection must include cancelation of nonelected claims or other appropriate action.

Specification

3. The amendment filed 04/21/04 is *still* objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: (claim 36-37) the specific language stating the

negative recitation that "*the at least one additive compound does not include lithium*". In this regard, it is noted that these language is unsupported by the original specification because the specification does not provide sufficient support for setting forth the specific negative limitations, that is to say, nowhere in the specification the examiner has found support to constructively sustain that lithium is not included or the additive compound is not coated as a coating. Thus, the foregoing language is not supported by the initial disclosure filed on 03/07/02.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 36-37 are still rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The added material which is not supported by the original disclosure is as follows: (claim 36-37) the specific language stating the negative recitation that "*the at least one additive compound does not include lithium*". In this regard, it is noted that these language is unsupported by the original specification because the specification does not provide sufficient support for setting forth the specific negative limitations, that is to say, nowhere in the specification the examiner has found support to constructively sustain that lithium is not included or the additive

compound is not coated as a coating. Thus, the foregoing language is not supported by the initial disclosure filed on 03/07/02. Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims (*at least*) 1-3, 10-11 and 36-39 are rejected under 35 U.S.C. 102(b) as being anticipated by the Japanese publication JP 09-171813 (hereinafter referred to as "*the JP'813 publication*").

The present claims are drawn to a positive active material composition wherein the disclosed inventive concept comprises the specific additive compound.

With respect to claims 1, 3, 10 and 36-37:

The JP'813 publication discloses a positive electrode active material including an inorganic material (ABSTRACT). In particular, the JP'813 publication discloses an active material comprising a lithiated compound and aluminum hydroxide (SECTION 0019-0021). *It is noted that aluminum hydroxide is a thermal absorbent element.*

As to claims 2, 11:

The JP'813 publication teaches the use of lithium multiple oxides such as LiCoO2, LiNiO2, LixNiyCo1-yO2 and LiMn2O4 (SECTION 0024).

Concerning claims 38-39:

The JP'813 publication teaches the mixing of the lithiated compound and the aluminum hydroxide upon formation thereof and having deposited the composite material on the electrode support (SECTION 0020) including forming a composite slurry which is applied to a foil (SECTIONS 0035-0038).

Thus, the present claims are anticipated.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-6, 10-14, 24, 33, 36-37 and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amatucci et al 5705291 in view of the Japanese publication JP 09-171813 (hereinafter referred to as "*the JP'813 publication*").

The present claims are drawn to a positive active material composition wherein the disclosed inventive concept comprises the specific additive compound.

In reference to claims 1 and 10:

Amatucci et al disclose a positive electrode comprising a lithiated composition particulate comprising the positive electrode which have been coated with a passivating layer of a composition comprising a borate, lithiated borate, aluminate, lithiated aluminate, silicate, lithiated silicate or mixture thereof (ABSTRACT). It is also disclosed that the lithiated intercalation compound is coated with coating compositions comprising boron oxide, boric acid, **lithium hydroxide**, aluminum oxide, lithium aluminate, lithium metaborate, silicon dioxide, lithium silicate or mixtures thereof (CLAIMS 1 and 6/ COL 2, lines 5-25). *It is noted that such coating compositions represent additive compounds, that is, compounds added to, included to or incorporated into the positive active material.*

6. A rechargeable battery cell comprising a negative electrode, a positive electrode, and an intermediate nonaqueous electrolyte characterized in that said positive electrode comprises a particulate lithium intercalation compound the particles of which are coated with a passivating layer comprising an annealed coating composition comprising boron oxide, boric acid, lithium hydroxide, aluminum oxide, lithium aluminate, lithium metaborate, silicon dioxide, lithium silicate, or mixtures thereof.

These objects, among others, have been achieved in the present invention by means of a novel lithium intercalation cell in which the surfaces of aggregate lithiated intercalation composition particulates comprising the positive cell electrode have been passivated by coating or encapsulation in a layer of a composition comprising a borate, lithiated borate, aluminate, lithiated aluminate, silicate, or lithiated silicate. Such a coating not only reduces the surface area, and thus the degree of activity, of the potentially catalytic particulate aggregates, but also provides a barrier layer which, while limiting contact between the electrolyte and the positive electrode particulates, does not seriously deter the passage of Li^+ ions.

In a preferred embodiment of the present invention, the surfaces of these particulates are coated with a layer of a composition comprising boron oxide, boric acid, lithium hydroxide, aluminum oxide, lithium aluminate, lithium metaborate, silicon dioxide, lithium silicate, or mixtures thereof. In another embodiment of the present invention, the

In reference to claims 2 and 11:

Amatucci et al teach the use of $LiCoO_2$, $LiNiO_2$ and $Li_{1+x}Mn_2O_4$ (COL 1, line 38-42). ***EXAMPLES 1-3*** illustrates the specific use of $LiMn_2O_4$ (EXAMPLES 1-3).

In reference to claims 3 and 10:

Amatucci et al shows with *sufficient specificity* the use of H_3BO_3 and/or B_2O_3 compounds among others. Amatucci et al also disclose the use of composition comprising a borate, lithiated borate, aluminate, lithiated aluminate, silicate, lithiated silicate or mixture thereof (ABSTRACT). It is also disclosed that the lithiated intercalation compound is coated with coating compositions comprising boron oxide, boric acid, lithium hydroxide, aluminum oxide, lithium aluminate, lithium metaborate, silicon dioxide, lithium silicate or mixtures thereof (CLAIMS 1 and 6/ COL 2, lines 5-25).

In this respect, it is noted that EXAMPLE 3 shows the use of B_2O_3 and $LiOH\text{-}H_2O$ to obtain a fine lithiated powder (EXAMPLE 3 or COL 5, lines 25-45). *Thus, it is contended that a secondary product of such mixture combination of B_2O_3 and $LiOH\text{-}H_2O$ can be a hydroxide of boron.*

In reference to claims 4, 12, 24 and 33:

It is disclosed that such additive compound can be added in an amount ranging from 0.4 to 1.0 % by weight (EXAMPLES 1-3). In particular, ***EXAMPLE 3*** shows the addition of 0.4 % of the borate powder (EXAMPLE 3).

In reference to claims 5 and 13:

As to the method limitation, i.e. *the additive compound being prepared by the specific drying and temperature treatment (heat treatment)*, it is noted that a method limitation

incorporated into a product claim does not patentable distinguish the product because what is given patentably consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made.

Moreover, Amatucci et al disclose the process of annealing the material at a temperature in the excess of about 400 °C, preferably in the range of about 500-800 °C (COL 2, lines 19-29). Hence, it is contended that at these temperatures, the drying of liquid necessarily occurs unless the liquid has an evaporation point higher than 800 °C. Nevertheless, the claim language is silent as to the specific chemical composition of the liquid subjected to the drying step.

In reference to claims 6 and 14:

It is disclosed that the coating composition has either a glassy or crystalline form (COL 4, lines 13-17); in particular, the borate is amorphous (EXAMPLE 1).

As to claim 38:

It is disclosed that positive electrode composition is associated with a current collector member all together (COL 2, lines 60-67).

Amatucci et al'291 disclose a coated positive electrode according to the foregoing aspects. However, the preceding prior art fails to expressly disclose the specific thermal absorbent material; the additive compound not including lithium and not coating with the additive compound.

With respect to claims 1, 3, 10 and 36-37:

The JP'813 publication discloses a positive electrode active material including an inorganic material (ABSTRACT). In particular, the JP'813 publication discloses an active

material comprising a lithiated compound and aluminum hydroxide (SECTION 0019-0021). *It is noted that aluminum hydroxide is a thermal absorbent element.*

As to claims 2, 11:

The JP'813 publication teaches the use of lithium multiple oxides such as LiCoO2, LiNiO2, LixNiyCo1-yO2 and LiMn2O4 (SECTION 0024).

Concerning claims 38-39:

The JP'813 publication teaches the mixing of the lithiated compound and the aluminum hydroxide upon formation thereof and having deposited the composite material on the electrode support (SECTION 0020) including forming a composite slurry which is applied to a foil (SECTIONS 0035-0038).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific additive compound not including lithium and not coating with the additive compound of the JP'813 publication in the positive active material of Amatucci et al as the JP'813 publication teaches that such additive compound provides a positive active material network structure with improved load and capacity characteristics; and excellent charging/discharging cycle-ability.

Double Patenting

11. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

12. Claims 1-6, 10-14, 24, 33, 36-37 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3, 11 and 15 of U.S. Patent No. 6797435. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

The '435 patent claims the following (CLAIMS 1-3, 11 and 15):

1. A positive active material for a rechargeable lithium battery comprising:

a core comprising a lithiated compound; and

at least two surface-treatment layers formed on said core, each of said surface-treatment layers comprising at least one compound selected from the group consisting of a coating-element-included hydroxide, a coating-element-included oxyhydroxide, a coating-element-included oxycarbonate, and a coating-element-included hydroxycarbonate,

wherein the coating element is selected from the group consisting of Al, Si, Ti, Sn, V, Ge, Ga, B, and As.

2. The positive active material according to claim 1, wherein:

the lithiated compound is selected from the group consisting of compounds represented by the formulas 1 to 13:

$Li_xMn_{1-y}M_yA_2$	(1)
$Li_xMn_{1-y}M_yO_{2-z}X_z$	(2)
$Li_xMn_2O_{4-z}X_z$	(3)
$Li_xMn_{2-y}M_yA_4$	(4)
$Li_xCo_{1-y}M_yA_2$	(5)
$Li_xCo_{1-y}M_yO_{2-z}X_z$	(6)
$Li_xNi_{1-y}M_yA_2$	(7)
$Li_xNi_{1-y}M_yO_{2-z}X_z$	(8)
$Li_xNi_{1-y}Co_yO_{2-z}X_z$	(9)
$Li_xNi_{1-y-z}Co_yM_zA_\alpha$	(10)
$Li_xNi_{1-y-z}Co_yM_zO_{2-\alpha}X_\alpha$	(11)
$Li_xNi_{1-y-z}Mn_yM_zA_\alpha$	(12)
$Li_xNi_{1-y-z}Mn_yM_zO_{2-\alpha}X_\alpha$	(13),

$0.95 \leqq x \leqq 1.1$, $0 \leqq y \leqq 0.5$, $0 \leqq z \leqq 0.5$, $0 \leqq \alpha \leqq 2$,

M is one selected from the group consisting of Al, Ni, Co, Mn, Cr, Fe, Mg, Sr, V, or rare earth elements,

A is selected from the group consisting of O, F, S and P, and

X is selected from the group consisting of F, S and P.

3. The positive active material according to claim 1, wherein said at least two surface-treatment layers comprise at least two coating elements selected from the group consisting of Al, Si, Ti, Sn, V, Ge, Ga, B, and As.

11. A positive active material for a rechargeable lithium battery comprising:

a core comprising a lithiated compound;

a first surface-treatment layer formed on said core, said first surface-treatment layer comprising at least one compound selected from the group consisting of an Al-included hydroxide, an Al-included oxyhydroxide, an Al-included oxycarbonate, and an Al-included hydroxycarbonate; and

a second surface-treatment layer formed on said first surface-treatment layer, said second surface-treatment

layer comprising at least one compound selected from the group consisting of an Si-included hydroxide, an Si-included oxyhydroxide, an Si-included oxycarbonate, and an Si-included hydroxycarbonate.

15. A positive active material for a rechargeable lithium battery, comprising:

a core comprising a lithium-cobalt based compound;

a first surface-treatment layer formed on said core, said first surface-treatment layer comprising at least one compound selected from the group consisting of an Si-included hydroxide, an Si-included oxyhydroxide, an Si-included oxycarbonate, and an Si-included hydroxycarbonate; and

a second surface-treatment layer formed on said first surface-treatment layer, said second surface-treatment layer comprising at least one compound selected from the group consisting of an Al-included hydroxide, an Al-included oxyhydroxide, an Al-included oxycarbonate, and an Al-included hydroxycarbonate.

In this case, the application claims are broader or more generic than the patent claims, thus, the application claims are anticipated by the patent claims. Accordingly, a broad limitation/range is anticipated by a narrow limitation/range which lies within the broad limitation. *In re Goodman.*

13. Claims 1-6, 10-14, 24, 33, 36-37 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 and 12-17 of U.S.

Patent No. 6753111. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

The '111 patent claims the following (CLAIMS 1-5 and 12-17):

1. A positive active material for a rechargeable lithium battery comprising:

a core comprising a lithiated compound, the lithiated compound comprising a secondary particle having an average size larger than or equal to 1 μm and smaller than 10 μm in diameter, the secondary particle being formed of an agglomeration of small primary particles of an average size of 1 to 3 μm in diameter; and

a surface-treatment layer on the core, the surface-treatment layer comprising a coating-element-included oxide or a coating-element-included hydroxide, oxyhydroxide, oxycarbonate, hydroxycarbonate or a mixture thereof.

2. The positive active material according to claim **1**, wherein the lithiated compound is at least one compound selected from the group consisting of compounds represented by the formulas 1 to 11:

$$Li_xMn_{1-y}M'_yA_2 \quad (1)$$

$$Li_xMn_{1-y}M'_yO_{2-z}X_z \quad (2)$$

$$Li_xMn_2O_{4-z}A_z \quad (3)$$

$$Li_xMn_{2-y}M'_yA_4 \quad (4)$$

$$Li_xM_{1-y}M''_yA_2 \quad (5)$$

$$Li_xMO_{2-z}A_z \quad (6)$$

$$Li_xNi_{1-y}Co_yO_{2-z}A_z \quad (7)$$

$$Li_xNi_{1-y-z}Co_yM''_zA_\alpha \quad (8)$$

$$Li_xNi_{1-y-z}Co_yM''_zO_{2-\alpha}X_\alpha \quad (9)$$

$$Li_xNi_{1-y-z}Mn_yM'_zA_\alpha \quad (10)$$

$$Li_xNi_{1-y-z}Mn_yM'_zO_{2-\alpha}X_\alpha \quad (11)$$

wherein:

$0.95 \leqq x \leqq 1.1, 0 \leqq y \leqq 0.5, 0 \leqq z \leqq 0.5, 0, \alpha \leqq 2$,

M is Ni or Co,

M' is at least one element selected from the group consisting of Al, Ni, Co, Cr, Fe, Mg, Sr, V, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ac, Th, and Pa,

M'' is at least one element selected from the group consisting of Al, Cr, Mn, Fe, Mg, Sr, V, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ac, Th, and Pa,

A is selected from the group consisting of O, F, S and P, and

X is selected from the group consisting of F, S and P.

3. The positive active material according to claim 1, wherein the coating element is selected from the group consisting of Mg, Al, Co, K, Na, Ca, Si, Ti, V, Ge, Ga, B, As, and Zr.

4. The positive active material according to claim 1, wherein the content of the coating element of the surface-treatment layer is 2×10^{-5} to 1 wt % based on the weight of positive active material.

5. The positive active material according to claim 4, wherein the content of the coating element of the surface-treatment layer is 0.001 to 1 wt % based on the weight of the positive active material.

In this case, the application claims are broader or more generic than the patent claims, thus, the application claims are anticipated by the patent claims. Accordingly, a broad limitation/range is anticipated by a narrow limitation/range which lies within the broad limitation. *In re Goodman.*

14. Claims 1-6, 10-14, 24, 33 and 36-37 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-15, 28-30, 32-35 of copending Application No. 10/189384 (*US Patent Application Publication 2003/0054250*). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

The copending application'384 claims the following (claims 1-15, 28-30, 32-35):

1. An active material for a battery, comprising:

a material that undergoes reversible electrochemical oxidation-reduction reactions and having a surface;

a surface treatment layer on the surface and comprising a conductive agent and at least one coating-element-containing compound selected from the group consisting of a coating-element-containing hydroxide, a coating-element-containing oxyhydroxide, a coating-element-containing oxycarbonate, a coating-element-containing hydroxycarbonate, and a mixture thereof.

2. The active material of claim 1, wherein said material is selected from the group consisting of a metal, a lithium-containing alloy, a compound that reversibly forms a lithium-containing compound by a reaction with lithium ions, a material that reversibly intercalates/deintercalates lithium ions and a lithiated intercalation compound.

3. The active material of claim 2, wherein said material comprises the lithiated intercalation compound that is selected from the group consisting of a lithium-containing metal oxide, a lithium-containing chalcogenide compound, and a carbon-based material.

4. The active material of claim 2, wherein said material comprises the lithiated intercalation compound that is at least one selected from the group consisting of a lithium compound with the following formulas (1) to (13):

$Li_xMn_{1-y}M_yA_2$	(1)
$Li_xMn_{1-y}M_yO_{2-z}X_z$	(2)
$Li_xMn_2O_{4-z}X_z$	(3)
$Li_xMn_{2-y}M_yA_4$	(4)
$Li_xCo_{1-y}M_yA_2$	(5)
$Li_xCo_{1-y}M_yO_{2-z}X_z$	(6)
$Li_xNi_{1-y}M_yA_2$	(7)
$Li_xNi_{1-y}M_yO_{2-z}X_z$	(8)
$Li_xNi_{1-y}Co_yO_{2-z}X_z$	(9)

-continued

$Li_xNi_{1-y-z}Co_yM_zA_\alpha$	(10)
$Li_xNi_{1-y-z}Co_yM_zO_{2-\alpha}X_\alpha$	(11)
$Li_xNi_{1-y-z}Mn_yM_zA_\alpha$	(12)
$Li_xNi_{1-y-z}Mn_yM_zO_{2-\alpha}X_\alpha$	(13)

wherein

$0.95 \leqq x < 1.1$; $0 \leqq y \leqq 0.5$; $0 \leqq z \leqq 0.5$; $0 \leqq \alpha \leqq 2$;

M is at least one element selected from the group consisting of Al, Ni, Co, Mn, Cr, Fe, Mg, Sr, V, and rare earth elements;

A is at least one element selected from the group consisting of O, F, S, and P; and

X is at least one element selected from the group consisting of F, S, and P.

5. The active material of claim 1, wherein the coating element is soluble in an organic solvent or water.

6. The active material of claim 5, wherein the coating element is at least one selected from the group consisting of an alkali metal, an alkaline earth metal, a group 13 element of the Periodic Table, a group 14 element of the Periodic Table, a group 15 element of the Periodic Table, and a transition metal.

7. The active material of claim 6, wherein the coating element is at least one selected from the group consisting of Mg, Al, Co, K, Na, Ca, Si, Ti, B, As, Zr, Sn, V, Ge, Ga, and a combination thereof.

8. The active material of claim 1, wherein the coating-element-containing compound has either an amorphous or a crystalline phase.

9. The active material of claim 1, wherein a thickness of said surface-treatment layer is 1 to 300 nm.

10. The active material of claim 9, wherein a thickness of said surface-treatment layer is 1 to 100 nm.

11. The active material of claim 1, wherein an amount of the coating element is 2×10^{-5} to 2% by weight of the active material.

12. The active material of claim 11, wherein the amount of the coating element is 0.001 to 2% by weight of the active material.

13. The active material of claim 1, wherein the conductive agent is at least one material selected from the group consisting of a carbon-based conductive agent, a graphite-based conductive agent, a metal-based conductive agent, and a metallic-compound-based conductive agent.

14. The active material of claim 1, wherein an amount of the conductive agent is 0.5 to 10% by weight of the active material.

15. The active material of claim 14, wherein the amount of the conductive agent is 1 to 5% by weight of the active material.

28. An active material for a battery comprising:

a material that has a surface and that undergoes reversible electrochemical oxidation-reduction reactions; and

a surface treatment layer on the surface, the layer comprising a conductive agent and an Al-containing compound selected from the group consisting of an Al-containing hydroxide, an Al-containing oxyhydroxide, an Al-containing oxycarbonate, an Al-containing hydroxycarbonate, and a mixture thereof.

29. An active material for a battery comprising:

a material that has a surface and that undergoes reversible electrochemical oxidation-reduction reactions; and

a surface treatment layer on the surface, the layer comprising a conductive agent and a B-containing compound selected from the group consisting of a B-containing hydroxide, a B-containing oxyhydroxide, a B-containing oxycarbonate, a B-containing hydroxycarbonate, and a mixture thereof.

30. An active material for a battery, comprising:

a material that has a surface and that undergoes reversible electrochemical oxidation-reduction reactions; and

a surface treatment layer coated on the surface, wherein said coated material is prepared by a method comprising:

adding a conductive agent and a coating-element source to a solvent selected from the group consisting of water, organic solvent, and a mixture thereof to prepare a coating liquid;

adding said material to the coating liquid to coat said material; and

drying the coated material to form the surface-treatment layer comprising the conductive agent and at least one coating-element-containing compound selected from the group consisting of a coating-element-containing hydroxide, a coating-element-containing oxyhydroxide, a coating-element-containing oxycarbonate, a coating-element-containing hydroxycarbonate, and a mixture thereof.

32. An electrode for use in a battery, comprising:

a current collector; and

an active material coated with a layer, the layer comprising a conductive agent and at least one compound selected from the group consisting of a coating-element-containing hydroxide, a coating-element-containing oxyhydroxide, a coating-element-containing oxycarbonate, a coating-element-containing hydroxycarbonate, and a mixture thereof,

wherein said active material is coated on said current collector.

33. A battery comprising:

a first electrode comprising a current collector and a coated active material, the coated active material comprising a layer including a conductive agent and at least one compound selected from the group consisting of a coating-element-containing hydroxide, a coating-element-containing oxyhydroxide, a coating-element-containing oxycarbonate, a coating-element-containing hydroxycarbonate, and a mixture thereof;

an electrolyte; and

a counter electrode spaced apart from said first electrode to perform reversible oxidation-reduction reactions with said first electrode through said electrolyte.

34. The active material of claim 1, wherein an average particle size of said material is 1 to 50 μm.

35. The active material of claim 34, wherein the average particle size is 5 to 20 μm.

In this case, the application claims are broader or more generic than the copending application'384 claims, thus, the application claims are anticipated by the copending application'384claims. Accordingly, a broad limitation/range is anticipated by a narrow limitation/range which lies within the broad limitation. *In re Goodman.*

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

15. Claims 1-6, 10-14, 24, 33 and 36-37 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 and 23-28 of copending Application No. 10/072923 (*US Patent Application Publication 2003/0003352*). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

The copending application'923 claims the following (CLAIMS 1-5 and 23-28):

1. A positive electrode for a rechargeable lithium battery, comprising:

a current collector;

a positive active material layer coated on said current collector, said positive active material layer comprising a positive active material; and

a surface-treatment layer on said positive active material layer, said surface treatment layer comprising a compound selected from the group consisting of a coating-element-included hydroxide, a coating-element-included oxyhydroxide, a coating-element-included oxycarbonate, a coating-element-included hydroxycarbonate, and a mixture thereof.

2. The positive electrode according to claim 1, wherein said positive active material comprises a lithiated compound selected from the group consisting of compounds represented by the formulas 1 to 13:

$Li_xMn_{1-y}M_yA_2$	(1)
$Li_xMn_{1-y}M_yO_{2-z}X_z$	(2)
$Li_xMn_2O_{4-z}X_z$	(3)
$Li_xMn_{2-y}M_yA_4$	(4)
$Li_xCo_{1-y}M_yA_2$	(5)
$Li_xCo_{1-y}M_yO_{2-z}X_z$	(6)
$Li_xNi_{1-y}M_yA_2$	(7)
$Li_xNi_{1-y}M_yO_{2-z}X_z$	(8)
$Li_xNi_{1-y}Co_yO_{2-z}X_z$	(9)
$Li_xNi_{1-y-z}Co_yM_zA_\alpha$	(10)
$Li_xNi_{1-y-z}Co_yM_zO_{2-\alpha}X_\alpha$	(11)
$Li_xNi_{1-y-z}Mn_yM_zA_\alpha$	(12)
$Li_xNi_{1-y-z}Mn_yM_zO_{2-\alpha}X_\alpha$	(13)

wherein:

$0.95 \leq x \leq 1.1$; $0 \leq y \leq 0.5$; $0 \leq z \leq 0.5$; $0 \leq a \leq 2$,

M is one element selected from the group consisting of Al, Ni, Co, Mn, Cr, Fe, Mg, Sr, V, and rare earth elements,

A is selected from the group consisting of O, F, S, and P, and

X is selected from the group consisting of F, S, and P.

3. The positive electrode according to claim 1, wherein said surface-treatment layer comprises a coating-element selected from the group consisting of Mg, Al, Co, k, Na, Ca, Si, Ti, Sn, V, Ge, Ga, B, As, and Zr.

4. The positive electrode according to claim 1, wherein said surface-treatment layer is formed by coating the positive active material layer with a coating liquid.

5. The positive electrode according to claim 4, wherein the coating process includes one of a dipping method and a vacuum impregnation method.

23. A positive electrode for a rechargeable lithium battery, comprising:

a current collector;

a positive active material layer coated on said current collector, said positive active material layer comprising a positive active material selected from the group consisting of lithium-cobalt chalcogenide, lithium-manganese chalcogenide, lithium-nickel chalcogenide and lithium-nickel-manganese chalcogenide; and

a surface-treatment layer on said positive active material layer, said surface treatment layer comprising a compound selected from the group consisting of a coating-element-included hydroxide, a coating-element-included oxyhydroxide, a coating-element-included oxycarbonate, a coating-element-included hydroxycarbonate, and a mixture thereof,

wherein the coating-element is one of Al and B.

24. A positive electrode for a rechargeable lithium battery, comprising:

a current collector;

a positive active material layer coated on said current collector, said positive active material layer comprising a $LiCoO_2$ positive active material; and

a surface-treatment layer disposed on said positive active material layer, said surface treatment layer comprising a compound selected from the group consisting of a coating-element-included hydroxide, a coating-element-included oxyhydroxide, a coating-element-included oxycarbonate, a coating-element-included hydroxycarbonate, and a mixture thereof,

wherein the coating-element is one of Al and B.

25. A lithium battery comprising:

a first electrode comprising a layer of a lithiated compound coated with a surface treatment layer, the surface treatment layer comprising one of a coating-element-included hydroxide, a coating-element-included oxyhydroxide, a coating-element-included oxycarbonate, a coating-element-included hydroxycarbonate, and a mixture thereof;

a second electrode comprising a material to reversibly intercalate lithium ions; and

a separator and an electrolyte disposed between said first and second electrodes.

26. The lithium battery of claim 25, wherein the coating element comprises one of Mg, Al, Co, K, Na, Ca, Si, Ti, V, Sn, Ge, B, As, and Zr.

27. The lithium battery of claim 25, wherein the surface treatment layer has a thickness of at or between 1 and 100 nm.

28. The lithium battery of claim 25, wherein said first electrode is prepared in accordance with a method comprising:

treating a current collector, which is coated with a layer of a positive active material, with a coating liquid, the coating liquid comprising one of a coating element and a coating-element-included compound; and

drying the treated current collector to form the surface treatment layer comprising one of the coating-element-included hydroxide, the coating-element-included oxyhydroxide, the coating-element-included oxycarbonate, the coating-element-included hydroxycarbonate, and a mixture thereof.

In this case, the application claims are broader or more generic than the copending application'923 claims, thus, the application claims are anticipated by the copending application'923 claims. Accordingly, a broad limitation/range is anticipated by a narrow limitation/range which lies within the broad limitation. *In re Goodman.*

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

16. Claims 1-6, 10-14, 24, 33 and 36-37 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 and 25-37 of copending Application No. 09/897445 (*US Patent Application Publication 2002/0071990).* Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

The copending application'445 claims the following (CLAIMS 1-10 and 25-37):

1. A positive active material for a rechargeable lithium battery comprising

a core comprising at least one lithiated compound; and

a surface-treatment layer on the core comprising at least one coating material selected from the group consisting of coating element included hydroxides, oxyhydroxides, oxycarbonates, hydroxycarbonates and a mixture thereof.

2. The positive active material of claim 1 wherein the lithiated compound is at least one lithiated compound represented by the formulas 1 to

$Li_xMn_{1-y}M'_yA_2$ (1)

$Li_xMn_{1-y}M'_yO_{2-z}A_z$ (2)

$Li_xMn_2O_{4-z}A_z$ (3)

$Li_xMn_{2-y}M'_yA_4$ (4)

$Li_xM_{1-y}M''_yA_2$ (5)

$Li_xMO_{2-z}A_x$ (6)

$Li_xNi_{1-y}Co_yO_{2-z}A_z$ (7)

$Li_xNi_{1-y-z}Co_yM''_zA_\alpha$ (8)

$Li_xNi_{1-y-z}Mn_yM'_zA_\alpha$ (9)

$Li_xNi_{1-y-z}Co_yM''_zO_{2-\alpha}$ (10)

$Li_xNi_{1-y-z}Mn_yM'_xO_{2-\alpha}X_\alpha$ (11)

where

$0.95 \leqq x \leqq 1.1, 0 \leqq y \leqq 0.5, 0 \leqq z \leqq 0.5, 0 \leqq \alpha \leqq 2$,

M is Ni or Co,

M' is at least one element selected from the group consisting of Al, Ni, Co, Cr, Fe, Mg, Sr, V, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ac, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No and Lr,

M' is at least one element selected from the group consisting of Al, Cr, Mn, Fe, Mg, Sr, V, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ac, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No and Lr,

A is selected from the group consisting of O, F, S and P, and

X is selected from the group consisting of F, S and P.

3. The positive active material of claim 1 wherein the coating element of the coating material is soluble in organic solvents or water.

4. The positive active material of claim 3 wherein the coating element of the coating material is at least one element selected from the group consisting of Mg, Al, Co, K, Na, Ca, Si, Ti, Sn, V, Ge, Ga, B, As, Zr, and a mixture thereof.

5. The positive active material of claim 1 wherein the coating material has amorphous or crystalline form.

6. The positive active material of claim 1 wherein the surface- treatment layer has a thickness in the range of 0.1 to 300nm.

7. The positive active material of claim 6 wherein the surface-treatment layer has a thickness in the range of 0.1 to 100nm.

8. The positive active material of claim 7 wherein the surface-treatment layer has a thickness in the range of 0.1 to 50nm.

9. The positive active material of claim 1 wherein the content of the coating element of the coating material is $2\times10^{}$ to 2 percent by weight based on the weight of the positive active material.

10. The positive active material of claim 9 wherein the content of the coating element of the coating material is 0.001 to 2 percent by weight based on the weight of the positive active material.

25. A positive active material for a rechargeable lithium battery comprising

a core comprising at least one lithiated compound; and

a surface-treatment layer on the core comprising coating element- included-hydroxide or oxyhydroxide.

26. The positive active material of claim 25 wherein the lithiated compound is at least one lithiated compound represented by formulas 1 to 11.

$Li_xMn_{1-y}M'_yA_2$ (1)

$Li_xMn_{1-y}M'_yA_{2-z}A_z$ (2)

$Li_xMn_2O_{4-z}A_z$ (3)

$Li_xMn_{2-y}M'_yA_4$ (4)

$Li_xM_{1-y}M''_yA_2$ (5)

$Li_xMO_{2-z}A_z$ (6)

$Li_xNi_{1-y}Co_yO_{2-z}A_z$ (7)

$Li_xNi_{1-y-z}Co_yM''_zA_\alpha$ (8)

$Li_xNi_{1-y-z}Mn_{y'z}A_\alpha$ (9)

$Li_xNi_{1-y-z}Co_yM''_zO_{2-\alpha}X_\alpha$ (10)

$Li_xNi_{1-y-z}Mn_yM'_zO_{2-\alpha}X_\alpha$ (11)

where

$0.95 \leqq x \leqq 1.1,\ 0 \leqq y \leqq 0.5, 0 \leqq z \leqq 0.5, 0 \leqq \alpha \leqq 2,$

M is Ni or Co,

M' is at least one element selected from the group consisting of Al, Ni, Co, Cr, Fe, Mg, Sr, V, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ac, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No and Lr, M'' is at least one element selected from the group consisting of Al, Cr, Mn, Fe, Mg, Sr, V, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ac, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No and Lr,

A is selected from the group consisting of O, F, S and P, and

X is selected from the group consisting of F, S and P.

27. The positive active material of claim 25 wherein the coating element of the surface treatment layer is soluble in organic solvents or water.

28. The positive active material of claim 25 wherein the coating element of the surface treatment layer is at least one element selected from the group consisting of Mg, Al, Co, K, Na, Ca, Si, Ti, Sn, V, Ge, Ga, B, As, Zr, and a mixture thereof.

29. The positive active material of claim 25 wherein the coating material has amorphous or crystalline form.

30. The positive active material of claim 25 wherein the content of the coating element of the surface-treatment layer is 2×10^{-5} to 2 percent by weight based on the weight of the positive active material.

31. The positive active material of claim 30 wherein the content of the coating element of the surface-treatment layer is 0.001 to 2 percent by weight based on the weight of the positive active material.

32. A positive active material for a rechargeable lithium battery comprising:

a core comprising a lithium-cobalt chalcogenide compound; and

a surface-treatment layer on the core comprising $Al(OH)_3$ or, AlO(OH).

33. The positive active material of claim 32 wherein the content of Al of the surface-treatment layer is 2×10^{-5} to 2 percent by weight based on the weight of the positive active material.

34. The positive active material of claim 33 wherein the content of Al of the surface-treatment layer is 0.001 to 2 percent by weight based on the weight of the positive active material.

35. A positive active material for a rechargeable lithium battery comprising:

a core comprising a lithium-manganese or lithium-cobalt chalcogenide compound; and

a surface-treatment layer on the core comprising $HB(OH)_2$.

36. The positive active material of claim 35 wherein the content of B of the surface-treatment layer is 2×10^{-5} to 2 percent by weight based on the weight of the positive active material.

37. The positive active material of claim 36 wherein the content of B of the surface-treatment layer is 0.001 to 2 percent by weight based on the weight of the positive active material.

In this case, the application claims are broader or more generic than the copending application'445 claims, thus, the application claims are anticipated by the copending application'445 claims. Accordingly, a broad limitation/range is anticipated by a narrow limitation/range which lies within the broad limitation. *In re Goodman.*

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

17. Claims 1-6, 10-14, 24, 33 and 36-37 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 and 25-37 of copending Application No. 10/627725 (*US Patent Application Publication 2004/0018429*). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

The copending application'725 claims the following (CLAIMS 1-10 and 25-37):

1. A positive active material for a rechargeable lithium battery comprising

a core comprising at least one lithiated compound; and

a surface-treatment layer on the core comprising at least one coating material selected from the group consisting of coating element included-hydroxides, oxyhydroxides, oxycarbonates, hydroxycarbonates and a mixture thereof.

2. The positive active material of claim 1 wherein the lithiated compound is at least one lithiated compound represented by the formulas 1 to 11,

$$Li_xMn_{1-y}M'_yA_2 \quad (1)$$

$$Li_xMn_{1-y}M'_yO_{2-z}A_z \quad (2)$$

$$Li_xMn_2O_{4-z}A_z \quad (3)$$

$$Li_xMn_{2-y}M'_yA_4 \quad (4)$$

$$Li_xM_{1-y}M''_yA_2 \quad (5)$$

$$Li_xMO_{2-z}A_z \quad (6)$$

$$Li_xNi_{1-y}Co_yO_{2-z}A_z \quad (7)$$

$$Li_xNi_{1-y-z}Co_yM''_zA_a \quad (8)$$

$$Li_xNi_{1-y-z}Mn_yM'_zA_a \quad (9)$$

$$Li_xNi_{1-y-z}Co_yM''_zO_{2-a}X_a \quad (10)$$

$$Li_xNi_{1-y-z}Mn_yM'_zO_{2-a}X_a \quad (11)$$

where

$0.95 \leqq x \leqq 1.1$, $0 \leqq y \leqq 0.5$, $0 \leqq z \leqq 0.5$, $0 \leqq 60 \leqq 2$,

M is Ni or Co,

M' is at least one element selected from the group consisting of Al, Ni, Co, Cr, Fe, Mg, Sr, V, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ac, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No and Lr,

M" is at least one element selected from the group consisting of Al, Cr, Mn, Fe, Mg, Sr, V, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ac, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No and Lr,

A is selected from the group consisting of O, F, S and P, and

X is selected from the group consisting of F, S and P.

3. The positive active material of claim 1 wherein the coating element of the coating material is soluble in organic solvents or water.

4. The positive active material of claim 3 wherein the coating element of the coating material is at least one element selected from the group consisting of Mg, Al, Co, K, Na, Ca, Si, Ti, Sn, V, Ge, Ga, B, As, Zr, and a mixture thereof.

5. The positive active material of claim 1 wherein the coating material has amorphous or crystalline form.

6. The positive active material of claim 1 wherein the surface-treatment layer has a thickness in the range of 0.1 to 300 nm.

7. The positive active material of claim 6 wherein the surface-treatment layer has a thickness in the range of 0.1 to 100 nm.

8. The positive active material of claim 7 wherein the surface-treatment layer has a thickness in the range of 0.1 to 50 nm.

9. The positive active material of claim 1 wherein the content of the coating element of the coating material is 2×10^{-5} to 2 percent by weight based on the weight of the positive active material.

10. The positive active material of claim 9 wherein the content of the coating element of the coating material is 0.001 to 2 percent by weight based on the weight of the positive active material.

25. A positive active material for a rechargeable lithium battery comprising

a core comprising at least one lithiated compound; and

a surface-treatment layer on the core comprising coating element-included-hydroxide or oxyhydroxide.

26. The positive active material of claim 25 wherein the lithiated compound is at least one lithiated compound represented by formulas 1 to 11,

$$Li_xMn_{1-y}M'_yA_2 \quad (1)$$

$$Li_xMn_{1-y}M'_yO_{2-z}A_z \quad (2)$$

$$Li_xMn_2O_{4-z}A_z \quad (3)$$

$$Li_xMn_{2-y}M'_yA_4 \quad (4)$$

$$Li_xM_{1-y}M''_yA_2 \quad (5)$$

$$Li_xMO_{2-z}A_z \quad (6)$$

$$Li_xNi_{1-y}Co_yO_{2-z}A_z \quad (7)$$

$$Li_xNi_{1-y-z}Co_yM''_zA_4 \quad (8)$$

$$Li_xNi_{1-y-z}Mn_yM'_zA_4 \quad (9)$$

$$Li_xNi_{1-y-z}Co_yM''_zO_{2-\alpha}X_\alpha \quad (10)$$

$$Li_xNi_{1-y-z}Mn_yM'_zO_{2-\alpha}X_\alpha \quad (11)$$

where

$0.95 \leqq x \leqq 1.1$, $0 \leqq y \leqq 0.5$, $0 \leqq z \leqq 0.5$, $0 \leqq \alpha \leqq 2$,

M is Ni or Co,

M' is at least one element selected from the group consisting of Al, Ni, Co, Cr, Fe, Mg, Sr, V, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ac, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No and Lr,

M'' is at least one element selected from the group consisting of Al, Cr, Mn, Fe, Mg, Sr, V, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ac, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No and Lr,

A is selected from the group consisting of O, F, S and P, and

X is selected from the group consisting of F, S and P.

27. The positive active material of claim 25 wherein the coating element of the surface treatment layer is soluble in organic solvents or water.

28. The positive active material of claim 25 wherein the coating element of the surface treatment layer is at least one element selected from the group consisting of Mg, Al, Co, K, Na, Ca, Si, Ti, Sn, V, Ge, Ga, B, As, Zr, and a mixture thereof.

29. The positive active material of claim 25 wherein the coating material has amorphous or crystalline form.

30. The positive active material of claim 25 wherein the content of the coating element of the surface-treatment layer is 2×10^{-5} to 2 percent by weight based on the weight of the positive active material.

31. The positive active material of claim 30 wherein the content of the coating element of the surface-treatment layer is 0.001 to 2 percent by weight based on the weight of the positive active material.

32. A positive active material for a rechargeable lithium battery comprising:

a core comprising a lithium-cobalt chalcogenide compound; and

a surface-treatment layer on the core comprising $Al(OH)_3$ or, AlO(OH).

33. The positive active material of claim 32 wherein the content of Al of the surface-treatment layer is 2×10^{-5} to 2 percent by weight based on the weight of the positive active material.

34. The positive active material of claim 33 wherein the content of Al of the surface-treatment layer is 0.001 to 2 percent by weight based on the weight of the positive active material.

35. A positive active material for a rechargeable lithium battery comprising:

a core comprising a lithium-manganese or lithium-cobalt chalcogenide compound; and

a surface-treatment layer on the core comprising $HB(OH)_2$.

36. The positive active material of claim 35 wherein the content of B of the surface-treatment layer is 2×10^{-5} to 2 percent by weight based on the weight of the positive active material.

37. The positive active material of claim 36 wherein the content of B of the surface-treatment layer is 0.001 to 2 percent by weight based on the weight of the positive active material.

In this case, the application claims are broader or more generic than the copending application'725 claims, thus, the application claims are anticipated by the copending application'725 claims. Accordingly, a broad limitation/range is anticipated by a narrow limitation/range which lies within the broad limitation. *In re Goodman.*

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

18. Applicant's arguments with respect to claims 1-6, 10-14, 24, 33 and 36-39 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro
Examiner
Art Unit 1745